

of the eye. It is "a small hook ground and roughened at its concave side, made of flexible silver, so that its curve may be changed according to the requirements of the case." The third instrument is a new ophthalmoscope. It is impossible to give a satisfactory description of it without the engravings. A full account of it, with some remarks on the use of the instrument in the diagnosis of refraction, may be found in the *Medical Record*, Jan. 15, 1874.

It consists substantially of a modification of the ophthalmoscope known as Loring's, by which the movable disks of the latter are replaced by two fixed disks, one containing convex glasses and the other concave. These disks are arranged so that the edges overlap in such a way that each glass of one disk may be superimposed upon each glass of the other, giving a great number and variety of combinations. The glasses are also protected from being soiled by a thin metal plate which covers them from behind.

We are sorry to miss the usual Annual Report on the Progress of Ophthalmology, which has seemed to us one of the most interesting and useful parts of the Society's work; certainly no part of it was better done.

G. C. H.

ART. XXVI.—*The Sphygmograph: its Physiological and Pathological Indications.* The Essay to which was awarded the Stevens Triennial Prize, by the College of Physicians and Surgeons, New York, April, 1873. By EDGAR HOLDEN, A.M., M.D. 8vo. pp. 169. Philadelphia: Lindsay & Blakiston, 1874.

THIS interesting volume presents an account of a large number of observations on the peculiarities of the radial pulse in health and disease, with sphygmographic tracings from a new instrument devised by the author. It is somewhat modified in form, as mentioned in the introductory note, from the essay as actually submitted in competition for the Stevens Prize, and the tracings presented have been reduced by careful selection, though they still amount to 275, a number amply sufficient to illustrate all the important points to which the reader's attention is directed. The tracings themselves have evidently, like the rest of the book, been printed with great care, and their white lines, in relief upon a black ground, are shown at the same time with unusual delicacy and distinctness.

The peculiarity in construction of the author's sphygmograph, as compared with that of Marey, is, in the first place, in the form of the end of the pulse-spring, which is placed in contact with, and is immediately acted on, by the artery. In Prof. Marey's instrument this part of the apparatus compresses the vessel directly from above downward, thus more or less flattening it if the pressure be considerable, and utilizing for the movement of the lever, the *lifting* power of the pulse alone. In Dr. Holden's sphygmograph the under surface of the compressing end of the pulse-spring is somewhat excavated, in such a manner as partly to surround the arterial cylinder, and thus to receive from it an impulse of *expansion*. This impulse is made to show itself in a lateral instead of a vertical direction, by bringing the excavated surface more closely in apposition with one side of the artery; and the tracing lever, which carries the pen-point, is also made to move from side to side in a horizontal plane, in obedience to the sweep of the pulse-lever. In this way the tracings are made upon a strip of paper, laid horizontally as in ordinary writing, only the paper, of course, travels in a longitudinal direction by means of clock-work, while the

pen remains at the same point, oscillating from side to side with the movements of the pulse.

The second peculiarity is intended to rectify a defect in former instruments, which Dr. Holden regards as a vital one, in regard to obtaining real accuracy and practical value for sphygmographic observations; that is, the absence of a ready and satisfactory means for graduating the pressure applied to the artery, and, consequently, for determining the tension and compressibility of the vessel. The author shows good reason for believing that without such accurate adjustment and record of the pressure applied, there can be no proper comparison of two tracings taken at different times, and even that in the same vessel the tracing which is really *characteristic* of its pulsation can only be obtained when the pressure is accurately gauged to a certain point, which point itself is to be determined by repeated trials.

This requirement is met in the present instance by using a coil of watch-spring to keep the pulse lever in contact with the artery, the spring itself being coiled or uncoiled at pleasure, and its tension increased or diminished by a simple and appropriate mechanism. The exact amount of pressure exerted by the spring at any moment is indicated by an index and graduated circle attached to the body of the instrument. Thus with each tracing is also recorded the position of the index, whether at 1° , 2° , $3\frac{1}{2}^{\circ}$, or 5° , and consequently the amount of compression to which the artery was subjected. With the index at 5° , the pressure exerted was equal to a weight of 10,620 grains.

In the first part of the work the author discusses the different phases or "events" of an arterial pulsation and the manner in which each is indicated by the corresponding curve of a tracing. The shock-wave, the systolic-wave, the period of collapse, and the diastolic or dicrotous wave are described in detail, and their physiological variations given in connection with the changes which they produce in the sphygmographic writing. In part second, which is devoted to the practical application of the sphygmograph, there is a very large number of illustrative tracings, taken from individuals suffering from various morbid affections or under the influence of medicinal agents. It is the opinion of the author that the practical value of the sphygmograph can be wholly attained only by the aid of a kind of sphygmographic dictionary, in which every possible variety of tracing shall be recorded and explained, and to which any individual tracing may be referred for information as to its character and probable indications; and the series of illustrations in the present essay may be regarded as contributions towards such a work.

There is no doubt that the sphygmograph, like other contrivances of a similar kind for recording, in a visible and permanent form, the delicate and rapid movements of the living organism, was an admirable invention, and, as improved by Marey, was exceedingly valuable as a means of physiological investigation. But it seems equally true that the high cost and delicate construction of the instrument, with the expenditure of time and careful manipulation requisite for its application, have thus far prevented its extended employment as an aid to diagnosis in practical medicine. Dr. Holden, who has evidently had much experience in its use, is convinced that, by the improvements introduced into its mechanism, and a judicious study of its tracings, it may be made much more useful than at present. To sum up, in his own words, the main objects of his essay, it is intended to show:—

"*First.* That the new principle in the construction of the instrument exhibits a new and wider field as within its scope.

"*Second.* The value of a knowledge of the minute peculiarities of the arterial

current, in connection with the determination of the condition of both the vascular and nervous system; and—

“*Third.* The power of the sphygmograph to develop this knowledge and correctly record it.” J. C. D.

ART. XXVII.—*Report of the Committee on the Yellow Fever Epidemic of 1873 at Shreveport, Louisiana.* Shreveport, 1874. 8vo. pp. 23.

THIS report on the origin and notable features of the terrible epidemic of yellow fever which invaded Shreveport last summer and decimated its population is highly interesting and creditable to the committee which drew it up. Their investigations were evidently conducted with great care and without bias, and their conclusions are marked by good sense.

Various causes are assigned for the origin of the epidemic; as the bad drainage of the city; its being introduced by a travelling circus company from Mexico; and the removal of the Red River raft.

With regard to the bad drainage of the city the Committee state: “The fact seems to be overlooked that this condition of the city has always existed, and while on general hygienic grounds, want of cleanliness may foster and render more malignant the disease when once introduced, there is no evidence that filth and garbage, dead dogs and cats (and one would imagine that our city was paved with them) have ever, by themselves, generated yellow fever.”

As to the circus theory it is stated that the company never were on Mexican soil.

The Red River raft theory is disposed of by the fact that “from 50 to 100 men have been constantly employed during the season in clearing out the raft and *not one case* of yellow fever has occurred among them,” whilst intermittent, remittent, and congestive fevers were not uncommon. “This,” the committee observes, “is certainly a sort of *experimentum crucis*, and in our minds ought forever to put an end to the discussion as to the malarial origin of yellow fever.

The real origin of the fever the committee ascribe to importation directly from Havanna to New Orleans and from thence to Shreveport by the Red River boats. The first is conclusively shown, but the latter, it seems to us, though rendered highly probable, is not so fully proven.

The epidemic commenced “attracting very general attention on the 27th of August, and spread soon with astonishing rapidity, and continued until frost on the 20th of October, continuing thus eight weeks. It was of a most malignant type. The committee, from data in their possession, “judge that the population remaining was about 4500 white and black; of this number at least 3000 were attacked and about 759 died. The blacks were almost as generally attacked as the whites, but the mortality was very much less, 639 whites dying and 120 blacks; this difference is in accord with the history of all previous epidemics of yellow fever. The greatest mortality occurred in persons between the ages of 20 and 35, men as a general rule being attacked more severely than women, and showing a higher rate of mortality. Children were more mildly attacked, but a large number of aged persons died. The percentage of deaths to the population was about 17. The percentage of deaths to those attacked was about 26.”